

We claim:

1. A fusion protein consisting essentially of an NS3, an NS4, and an NS5a polypeptide of a hepatitis C virus (HCV).
2. A fusion protein consisting essentially of an NS3, an NS4, an NS5a, and NS5b polypeptide of an HCV.
3. A fusion protein according to either of claims 1 or 2, wherein one of the HCV polypeptides is derived from a different strain of HCV than the other HCV polypeptides.
4. The fusion protein of claim 3 wherein each of the HCV polypeptides is derived from a different strain of HCV.
5. A composition comprising:
 - (a) a fusion protein according to either of claims 1 or 2; and
 - (b) a pharmaceutically acceptable excipient.
6. A composition comprising:
 - (a) a fusion protein according to claim 4; and
 - (b) a pharmaceutically acceptable excipient.
7. A composition consisting essentially of:
 - (a) an isolated and purified NS3 polypeptide of a hepatitis C virus (HCV);
 - (b) an isolated and purified NS4 polypeptide of a HCV;
 - (c) an isolated and purified NS5a polypeptide of a HCV; and
 - (d) a pharmaceutically acceptable excipient and optionally an adjuvant.

8. A composition consisting essentially of:
- (a) an isolated and purified NS3 polypeptide of a hepatitis C virus (HCV);
 - (b) an isolated and purified NS4 polypeptide of a HCV;
 - (c) an isolated and purified NS5a polypeptide of a HCV;
 - 5 (d) an isolated and purified NS5b polypeptide of a HCV; and
 - (e) a pharmaceutically acceptable excipient and optionally an adjuvant.
9. An isolated and purified polynucleotide which encodes a fusion protein according to either of claims 1 or 2.
- 10
10. An isolated and purified polynucleotide which encodes the fusion protein of claim 4.
11. A composition comprising:
- 15 (a) the isolated and purified polynucleotide of claim 9; and
 - (b) a pharmaceutically acceptable excipient.
12. The composition of claim 11 wherein the polynucleotide is DNA.
13. The composition of claim 12 wherein the polynucleotide is in a plasmid.
- 20
14. A composition comprising:
- (a) an isolated and purified polynucleotide according to claim 10; and
 - (b) a pharmaceutically acceptable excipient.
- 25
15. The composition of claim 14 wherein the polynucleotide is DNA.
16. The composition of claim 15 wherein the polynucleotide is in a plasmid.

17. A composition consisting essentially of:
- (a) an isolated and purified polynucleotide encoding an NS3 polypeptide of a hepatitis C virus (HCV);
 - (b) an isolated and purified polynucleotide encoding an NS4 polypeptide of a HCV;
 - (c) an isolated and purified polynucleotide encoding an NS5a polypeptide of a HCV; and
 - (d) a pharmaceutically acceptable excipient and optionally an adjuvant.
18. The composition of claim 17 wherein the polynucleotide is DNA.
19. The composition of claim 18 wherein the polynucleotide is in a plasmid.
20. A composition consisting essentially of:
- (a) an isolated and purified polynucleotide encoding an NS3 polypeptide of a hepatitis C virus (HCV);
 - (b) an isolated and purified polynucleotide encoding an NS4 polypeptide of a HCV;
 - (c) an isolated and purified polynucleotide encoding an NS5a polypeptide of a HCV;
 - (d) an isolated and purified polynucleotide encoding an NS5b polypeptide of a HCV; and
 - (e) a pharmaceutically acceptable excipient and optionally an adjuvant.
21. The composition of claim 20 wherein the polynucleotide is DNA.
22. The composition of claim 21 wherein the polynucleotide is in a plasmid.

23. A method of activating T cells which recognize an epitope of an HCV polypeptide, comprising the step of:

contacting T cells with a fusion protein of either of claims 1 or 2, whereby a population of activated T cells recognizes an epitope of the NS3, NS4, NS5a, or NS5b polypeptides.

24. The method of claim 23 wherein the T cells are obtained from a mammal selected from the group consisting of a mouse, a baboon, a chimpanzee, and a human.

25. The method of claim 24 wherein the mammal is infected with an HCV.

26. The method of claim 24 wherein the mammal is not infected with an HCV.

27. The method of claim 23 wherein the population of T cells comprises CD4⁺ T cells.

28. The method of claim 23 wherein the population of T cells comprises CD8⁺ T cells.

29. The method of claim 28 wherein the CD8⁺ T cells express interferon- γ .

30. The method of claim 28 wherein the CD8⁺ T cells specifically recognize an epitope of an NS5a polypeptide.

31. The method of claim 30 wherein the epitope is selected from the group consisting of the epitopes shown in SEQ ID NO:1 and SEQ ID NO:2.

32. The method of claim 23 wherein the T cells comprise CD8⁺ and CD4⁺ T cells.

33. The method of claim 23 wherein the step of contacting further comprises
5 contacting the T cells with an adjuvant.

34. The method of claim 23 wherein the fusion protein is provided by a polynucleotide encoding the fusion protein.

10 35. The method of claim 34 wherein the polynucleotide is DNA.

36. The method of claim 34 wherein the polynucleotide is RNA.

37. The method of claim 23 wherein the T cells are in a mammal.

15 38. The method of claim 37 wherein the mammal is selected from the group consisting of a mouse, a baboon, a chimpanzee, and a human.

39. The method of claim 37 wherein the mammal is infected with an HCV.

20 40. The method of claim 37 wherein the mammal is not infected with an HCV.

41. A method of activating T cells which recognize an epitope of an HCV polypeptide, comprising the step of:

25 contacting T cells with a composition according to claim 7, whereby a population of activated T cells recognizes an epitope of the NS3, NS4, NS5a, or NS5b polypeptides.

42. A method of activating T cells which recognize an epitope of an HCV polypeptide, comprising the step of:

contacting T cells with a composition according to claim 8, whereby a population of activated T cells recognizes an epitope of the NS3, NS4, NS5a, or NS5b polypeptides.

5

43. A method of activating T cells which recognize an epitope of an HCV polypeptide, comprising the step of:

contacting T cells with a composition according to claim 17, whereby a population of activated T cells recognizes an epitope of the NS3, NS4, NS5a, or NS5b polypeptides.

10

44. A method of activating T cells which recognize an epitope of an HCV polypeptide, comprising the step of:

contacting T cells with a composition according to claim 20, whereby a population of activated T cells recognizes an epitope of the NS3, NS4, NS5a, or NS5b polypeptides.

15